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## MALARIA

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**CLINICAL FEATURES:** The symptoms of malaria include high fever, chills, rigor, and headache, which may be recurrent and suddenly. If untreated fever and other symptom may occur in a cyclical pattern every second or third day. Other commonly associated symptoms include back pain, sweats, myalgia, nausea, vomiting, diarrhea, and cough. Untreated *Plasmodium falciparum* infection can lead to coma, renal failure, pulmonary edema, and death. The diagnosis of malaria should be considered for any person who has these symptoms and who has traveled to an area in which malaria is endemic. Asymptomatic parasitemia can occur among persons who have been long-term residents of areas in which malaria is endemic.

**CAUSATIVE AGENT:** *Plasmodium vivax*, *P. ovale*, *P. malaria*, or *P. falciparum*

**MODE OF TRANSMISSION:** By the bite of an infective female *Anopheles spp.* mosquito. Most species feed at dusk and during early night hours; some important vectors have biting peaks around midnight or early hours of morning. Malaria may also be transmitted by injection or transfusion of blood of infected persons or by use of contaminated needles or syringes, as by drug users. Humans are the only important reservoir of human malaria.

**INCUBATION PERIOD:** The time between the infective bite and the appearance of clinical symptoms is approximately 9 to 14 days for *P. falciparum*, 12 to 18 days for *P. vivax* and *P. ovale*, and 18 to 40 days for *P. malariae*.

**PERIOD OF COMMUNICABILITY:** *Plasmodium* may be passed on to biting mosquitoes as long as infective gametocytes are present in human blood; this varies from one to five years depending on the parasite species and response to treatment. The mosquito remains infective for life. Transmission by transfusion may occur as long as asexual forms remain in the circulating blood, up to 40 years. Stored blood can remain infective for at least one month.

**PUBLIC HEALTH SIGNIFICANCE:** Even though malaria is not endemic to the United States or Kansas, it remains a public health threat for several reasons: (1) most persons have no protective immunity and can develop a rapid severe disease, (2) malaria cases can transmit the parasites to local mosquitoes, which in turn can pass it onto local residents.

Cases of malaria in Kansas have been reported among individuals with history of foreign travel. Persons traveling to areas at high risk for malaria can protect themselves by taking effective antimalarial drugs and following measures to prevent mosquito bites.

**REPORTABLE DISEASE IN KANSAS SINCE:** 1982

## LABORATORY CRITERIA FOR SURVEILLANCE PURPOSES

- Detection of circulating malaria-specific antigens using rapid diagnostic test (RDT), **OR**
- Detection of species specific parasite DNA in a sample of peripheral blood using a Polymerase Chain Reaction test, **OR**
- Detection of malaria parasites in thick or thin peripheral blood films.

## SURVEILLANCE CASE DEFINITIONS

- *Confirmed:*
  - Detection and specific identification of malaria parasites by microscopy on blood films in a laboratory with appropriate expertise in any person (symptomatic or asymptomatic) diagnosed in the United States, regardless of whether the person experienced previous episodes of malaria while outside the country, **OR**
  - Detection of *Plasmodium* species by nucleic acid test in any person (symptomatic or asymptomatic) diagnosed in the United States, regardless of whether the person experienced previous episodes of malaria while outside the country.

## COMMENT

- A subsequent attack experienced by the same person but caused by a different *Plasmodium* species is counted as an additional case. A subsequent attack experienced by the same person and caused by the same species in the United States may indicate a relapsing infection or treatment failure caused by drug resistance or a separate attack.

## EPIDEMIOLOGY AND TRENDS

In 2011, ten confirmed cases of malaria were reported in Kansas. The cases ranged from 3 to 76 years of age, with a median age of 43 years. Seven cases were male. The three-year median for 2008-2010 was nine cases.

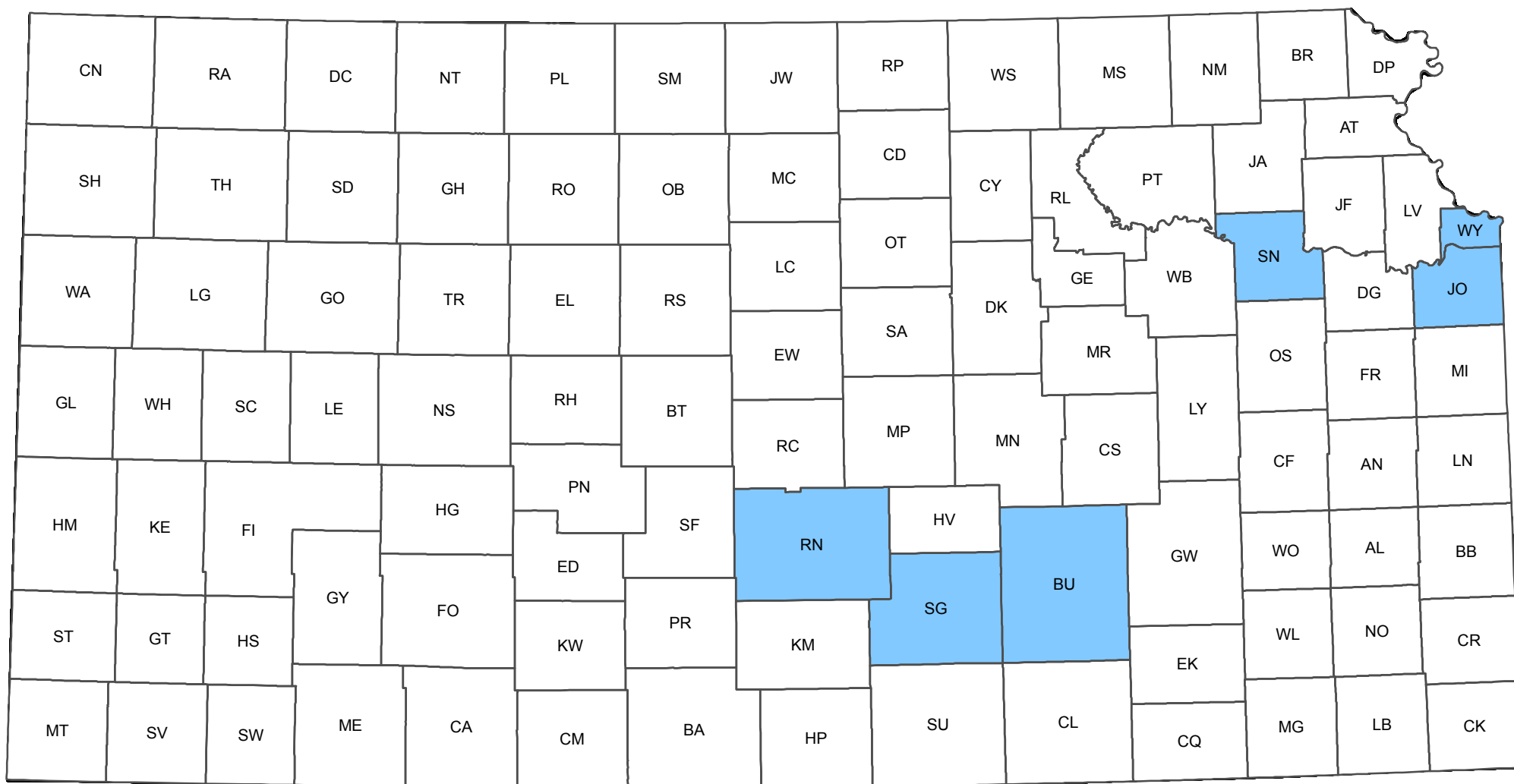
All cases reported travel to or from malaria endemic regions: Africa (8), Haiti (1), and Southeast Asia (1). The causative agent was reported for eight cases; five cases were infected with *P. falciparum*, two with *P. vivax*, and one with *P. ovale*.

### Confirmed Cases: 10

Kansas incidence per 100,000 population (2011): 0 . 4

U.S. incidence per 100,000 population (2010): 0 . 6

# Malaria Incidence Rate per 100,000 by County, 2011



Incidence rate per 100,000 residents

0 0.1 - 4.9